Title: Polynucleotide Sequence Encoding Cysteine Protease for Modulation of Coffee Flavour Precursor Levels in Green Coffee Grains (*as modified*)
Inventor: McCarthy, *et al.*
App. No.: 10/559,986
Docket No.: 112701-667
REPLACEMENT DRAWING

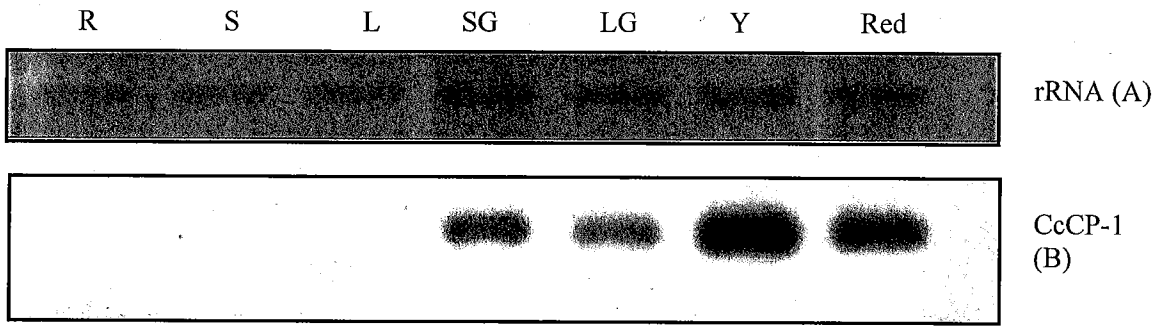

Figure 1: Northern blot analysis of the expression of the cysteine proteinase (CcCP1) gene in different tissues of *Coffea arabica*.

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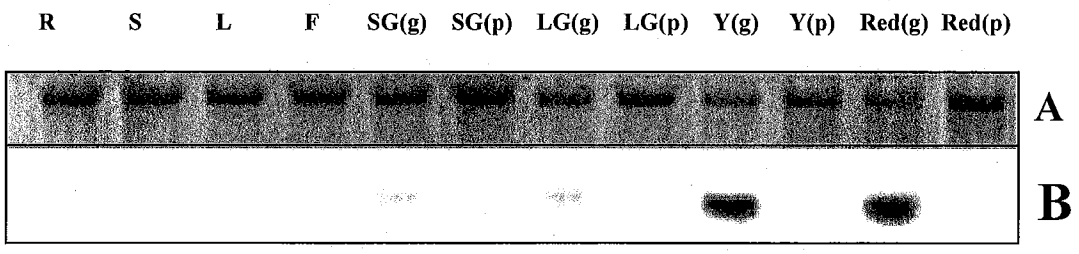
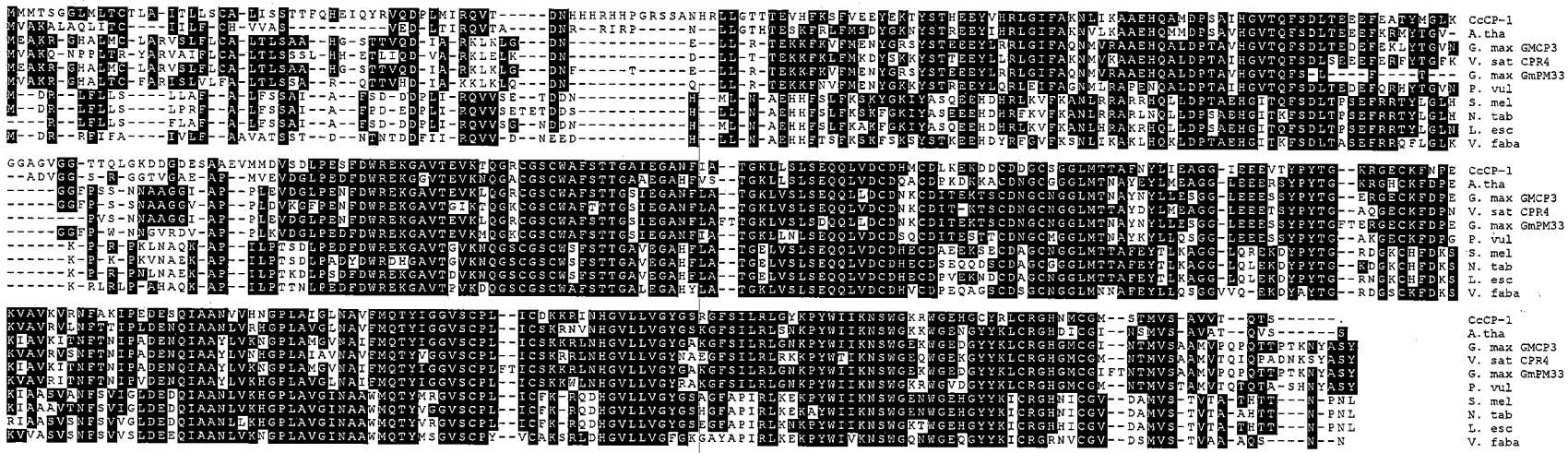


Figure 2A: Northern blot analysis of the expression of the Cysteine proteinase CcCP-1 gene in different tissues of *Coffea arabica.*



CcCP-1 (SEQ ID NO: 46)
A.tha (SEQ ID NO: 47)
G. max GMCP3 (SEQ ID NO: 48)
V. sat CPR4 (SEQ ID NO: 49)
G. max GmPM33 (SEQ ID NO: 50)
P. vul (SEQ ID NO: 51)
S. mel (SEQ ID NO: 52)
N. tab (SEQ ID NO: 53)
L. esc (SEQ ID NO: 54)
V. faba (SEQ ID NO: 55)

Figure 2B: Alignment of the full sequence of the protein encoded by CcCP-1 cDNA with other full-length cysteine proteinases available in the NCBI database.

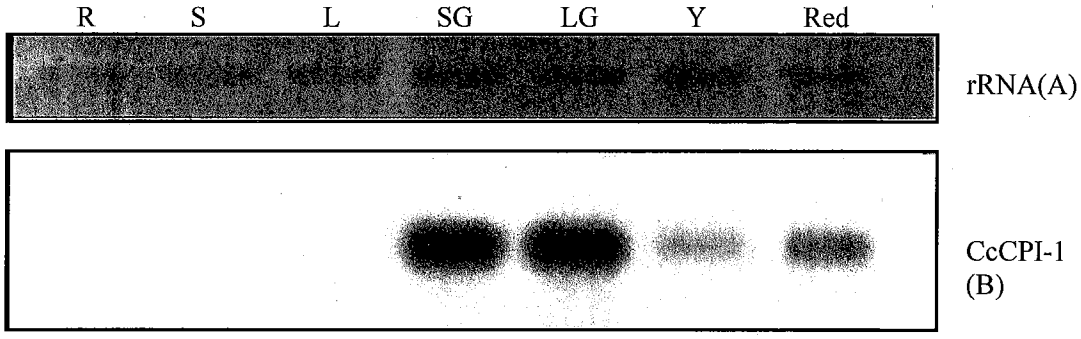


Figure 3: Northern blot analysis of the expression of the cysteine proteinase inhibitor (CcCPI-1) gene in different tissues of *Coffea arabica.*

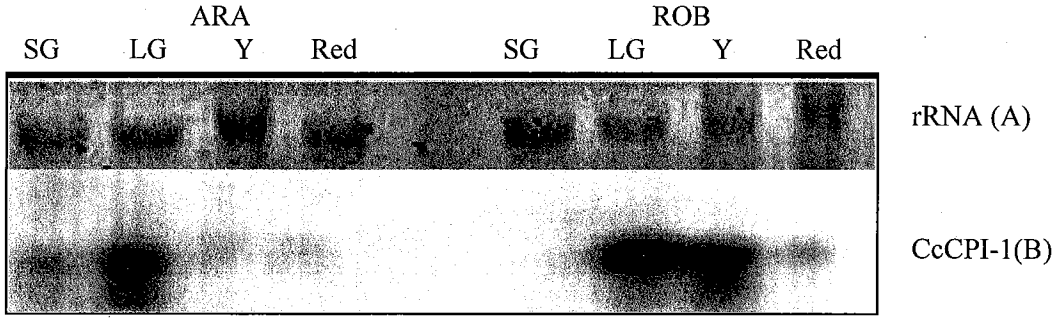


Figure 4: Northern blot analysis of the expression of the cysteine proteinase inhibitor gene (CcCPI-1) at different cherry development stages for *Coffea arabica* (ARA) and *Coffea canephora* (ROB).

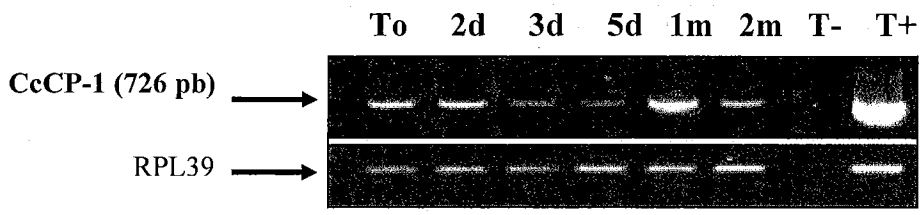


Figure 5. RT-PCR analysis of the expression of *CcCP-1* during *Coffea arabica* grain germination.

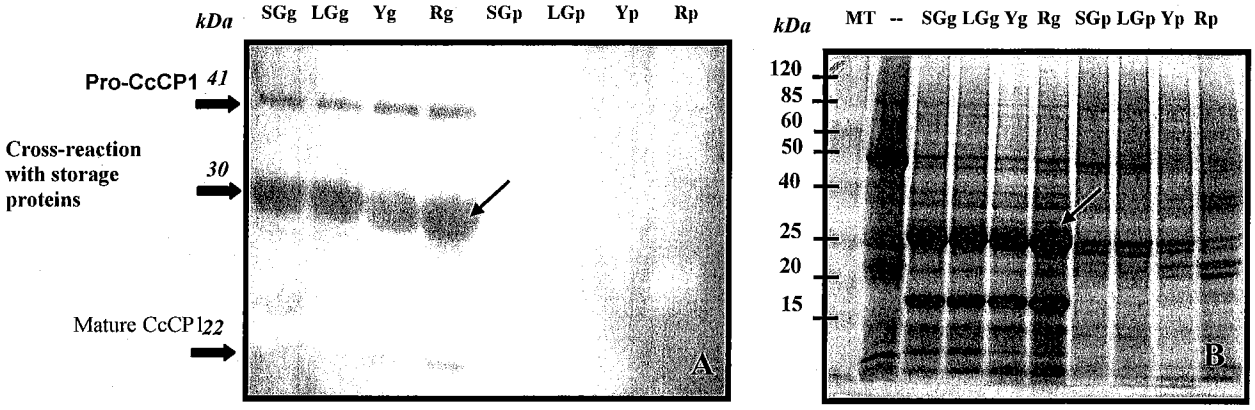
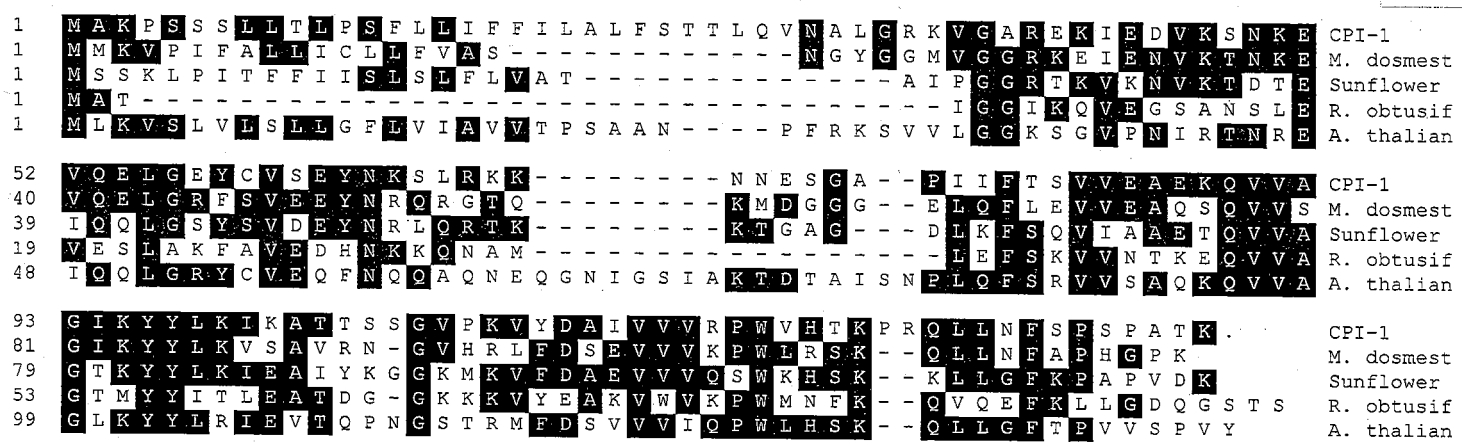


Figure 6A: Western-blot analysis of the expression of CcCP1 protein (A).



CPI-1 (SEQ ID NO: 56)
M. dosmest (SEQ ID NO: 57)
Sunflower (SEQ ID NO: 58)
R. obtusif (SEQ ID NO: 59)
A. thaliana (SEQ ID NO: 60)

Figure 6B: Optimal alignment of the complete protein encoded by CcCPI-1 cDNA with other homologous full-length cysteine proteinases available in the NCBI.

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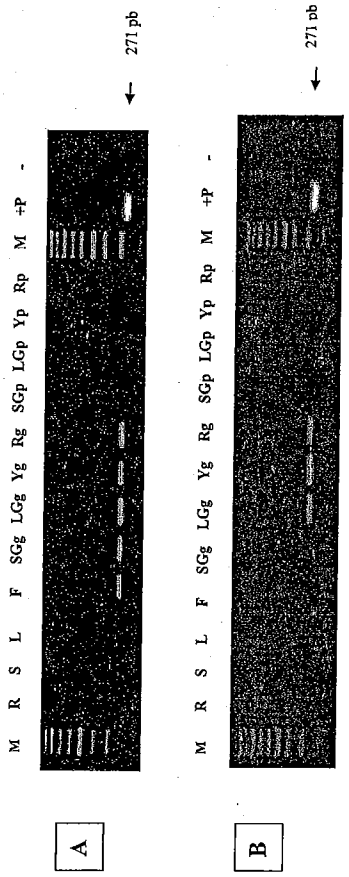

Figure 7: RT-PCR analysis of the expression of CcCPI-1 gene in different tissues of *Coffea arabica* CCCA2 (A) *and Coffea robusta* FRT-32 (B).

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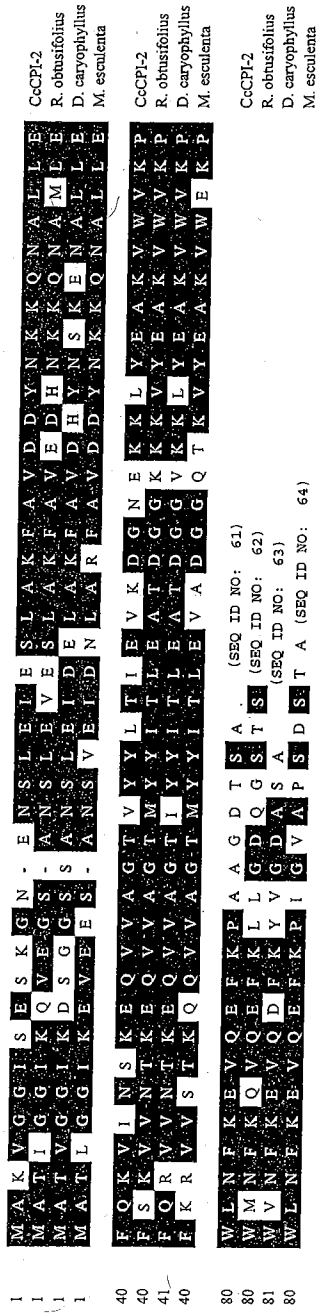

Figure 8: Optimal alignment of the complete protein encoded by CcCPI-2 cDNA with other homologous full-length cysteine proteinases available in the NCBI.

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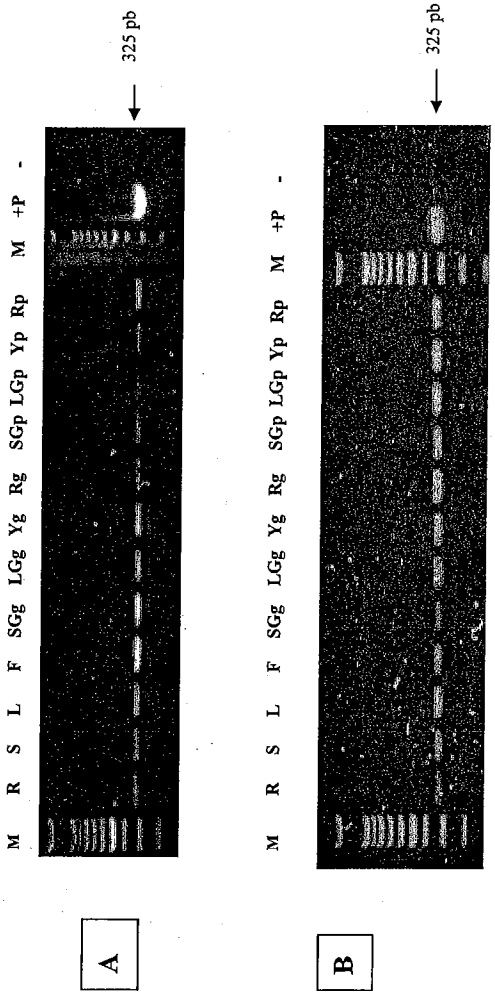

Figure 9: RT-PCR analysis of the expression of CcCPI-2 gene in different tissues of *Coffea arabica* CCCA2 (A) *and Coffea robusta* FRT-32 (B).

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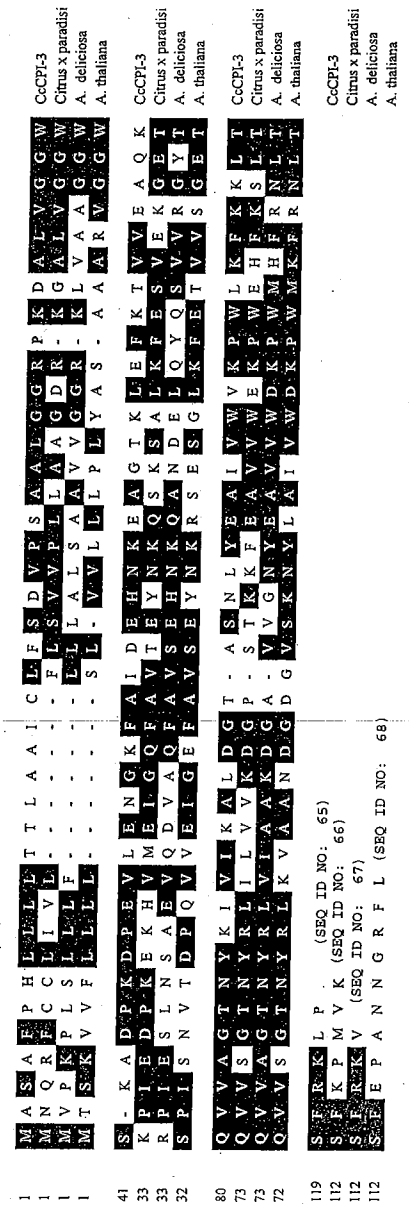

Figure 10: Optimal alignment of the complete protein encoded by CcCPI-3 cDNA with other homologous full-length cysteine proteinases available in the NCBI.

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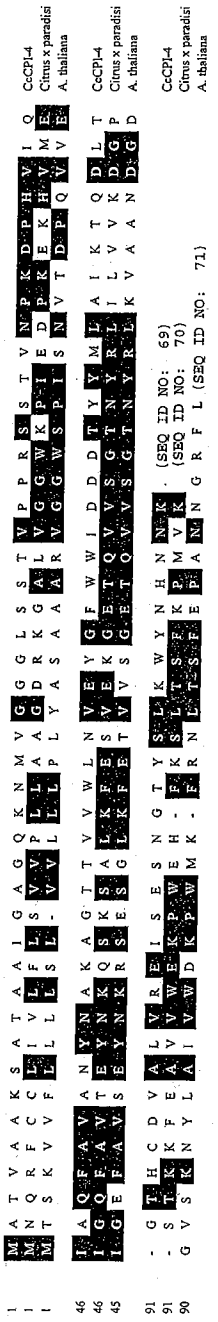

Figure 11: Optimal alignment of the complete protein encoded by CcCPI-4 cDNA with other homologous full-length cysteine proteinases available in the NCBI.

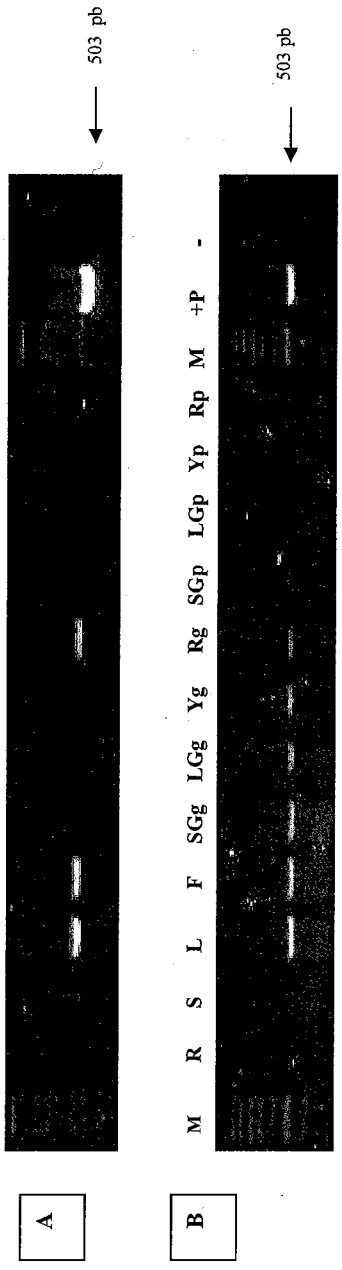

Figure 12: RT-PCR analysis of the expression of CcCPI-4 gene in different tissues of *Coffea arabica* CCCA2 (Panel A) and of *Coffea robusta FRT-32 (Panel B)*

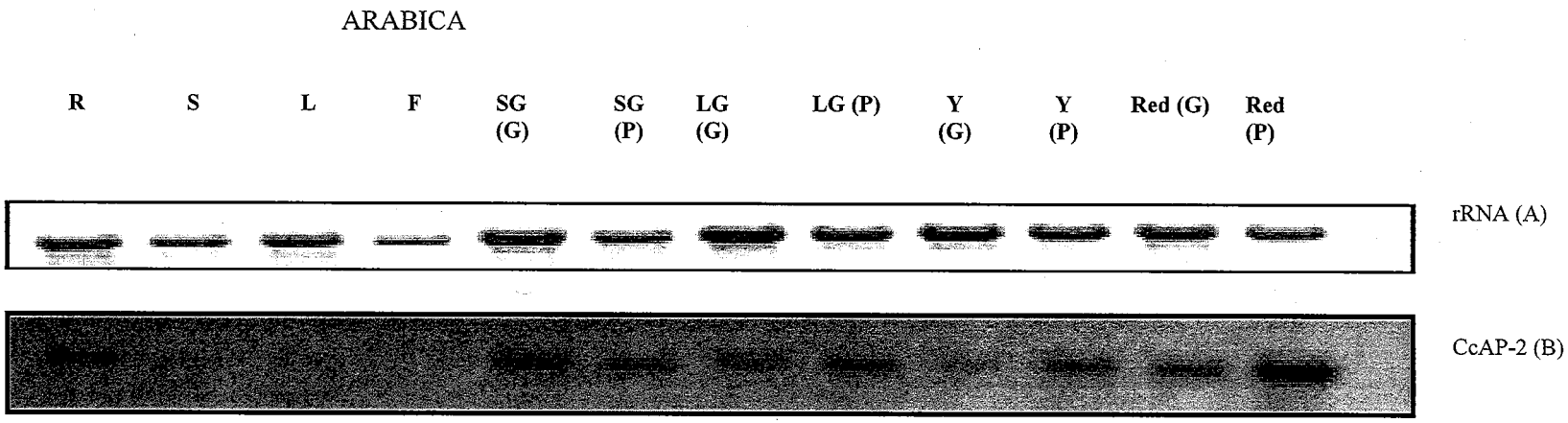

Figure 13: Northern blot analysis of the expression of the aspartic proteinase 2 (CcAP2) gene in different tissues of *Coffea arabica*.

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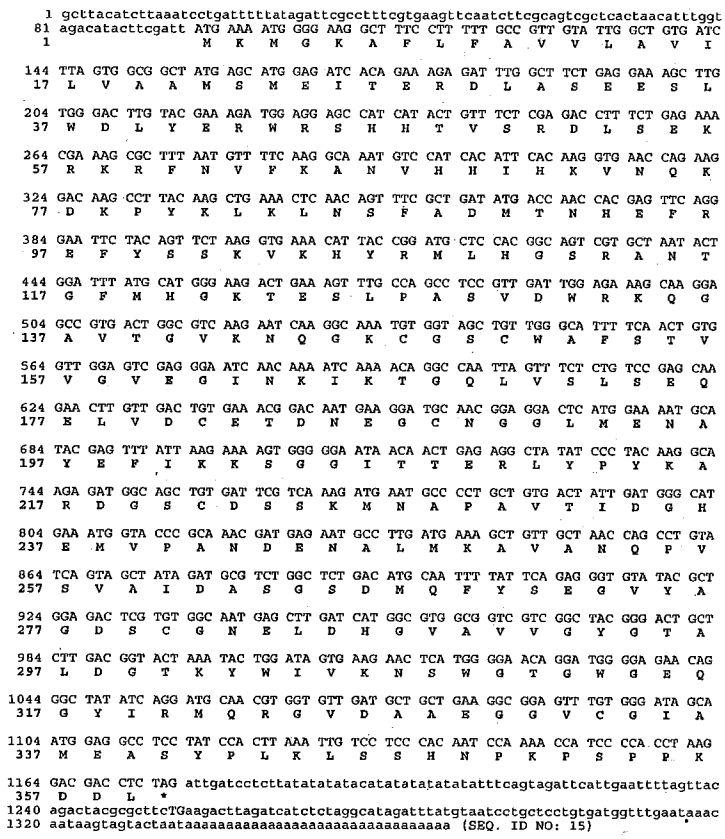

Figure 14: cDNA sequence and its deduced amino acid sequence of CcCP-4. Lowercase: 5' and 3' non-translated regions; Uppercase: Open reading frame; Bold character: amino acid sequence; *: stop codon.

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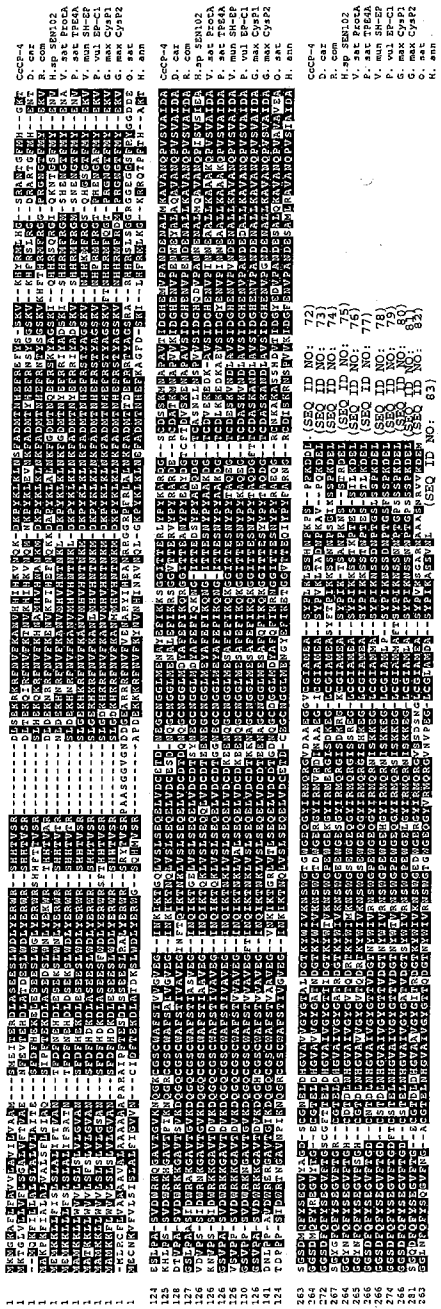

Figure 15: Alignment of the full sequence of the protein encoded by CcCP-4 cDNA with other full-length cysteine proteinases available in the NCBI database

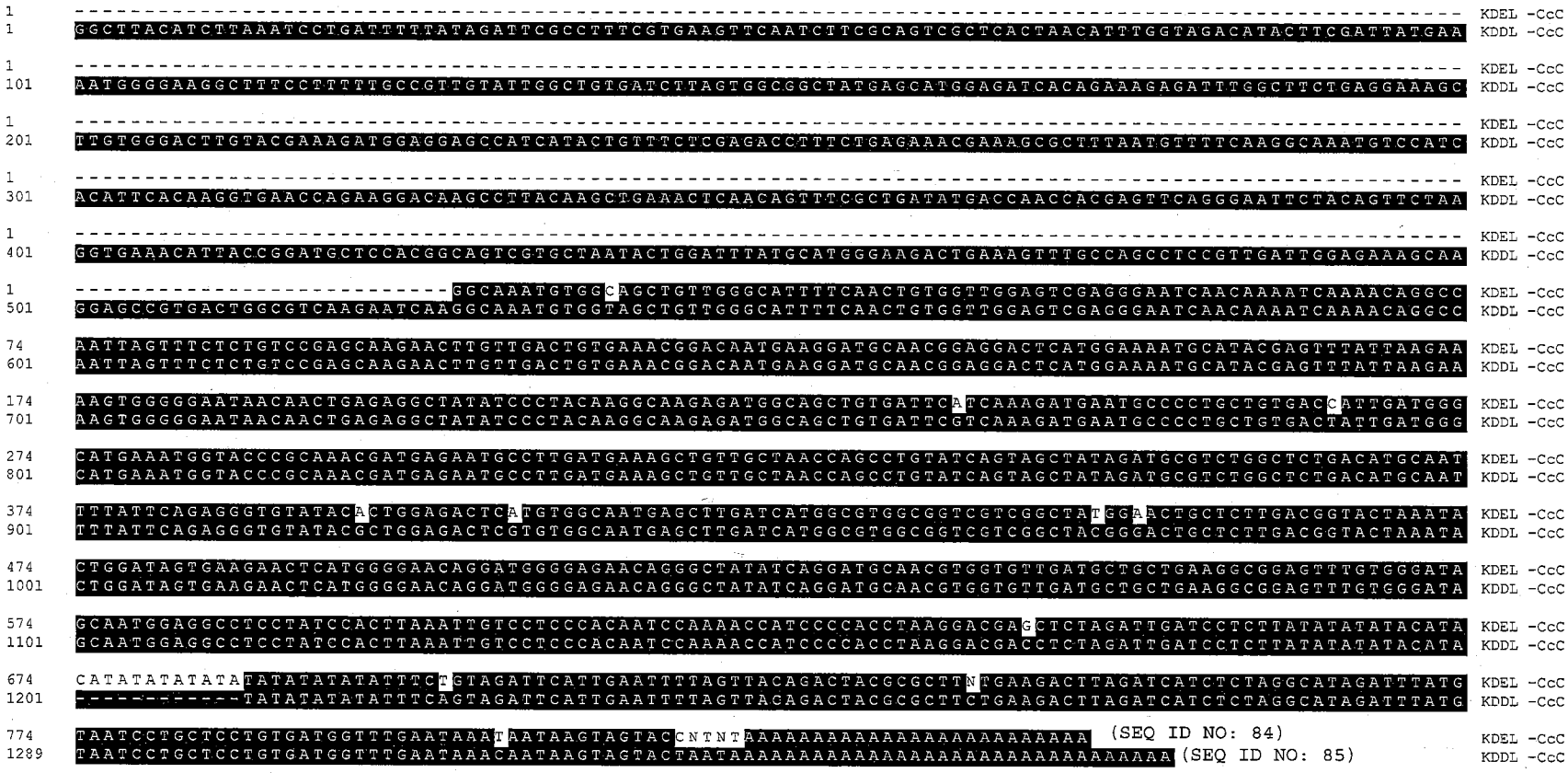

Figure 16. The full length cDNA sequence CcCP-4 KDDL and the partial cDNA sequence CcCP-4 (KDEL).

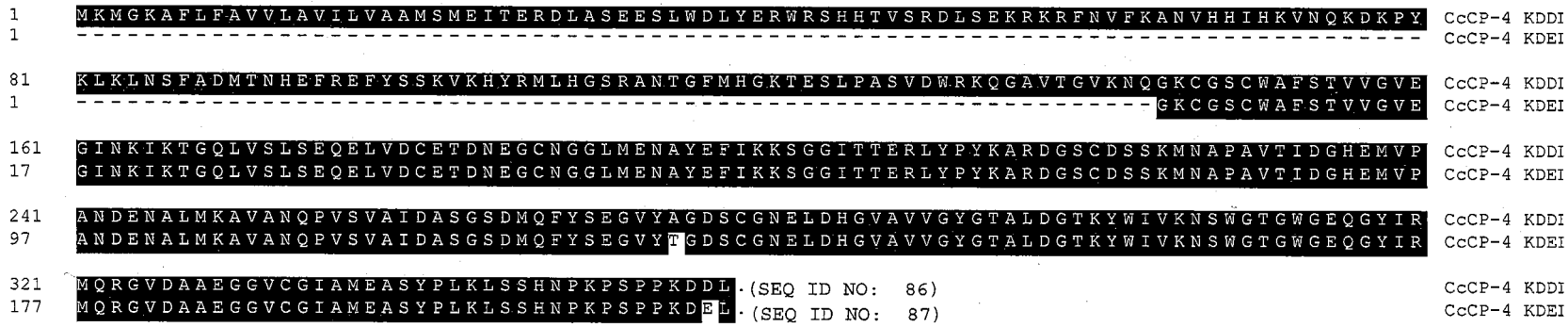

Figure 17. The complete open reading frame of CcCP-4 (KDDL) and the partial open reading frame of CcCP-4 (KDEL).

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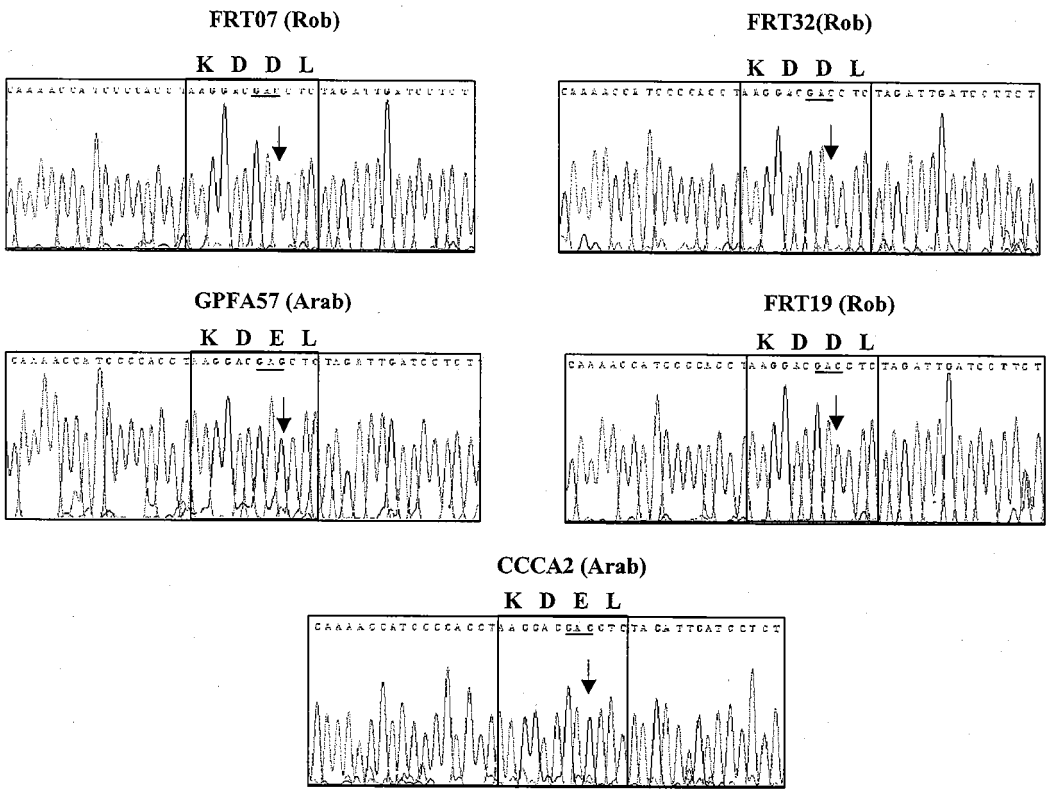

Figure 18. DNA sequence chromatograms for PCR amplified genomic DNA encoding the KDEL/KDDL region of the CcCP-4 gene.

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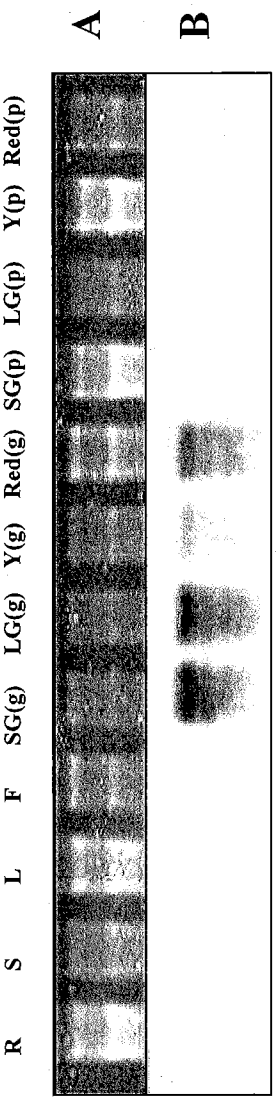


Figure 19. Northern blot analysis of the expression of the Cysteine proteinase CcCP-4 gene in different tissues of *Coffea arabica* .

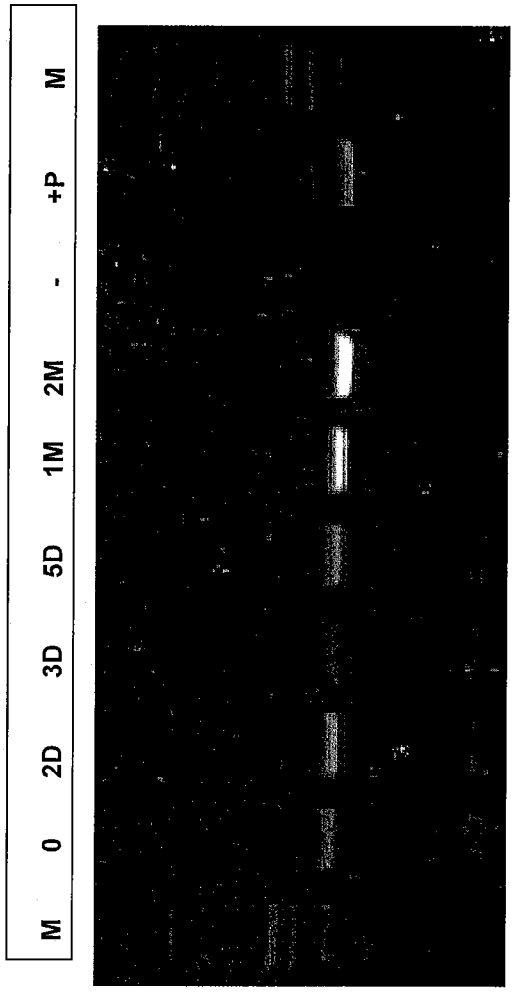
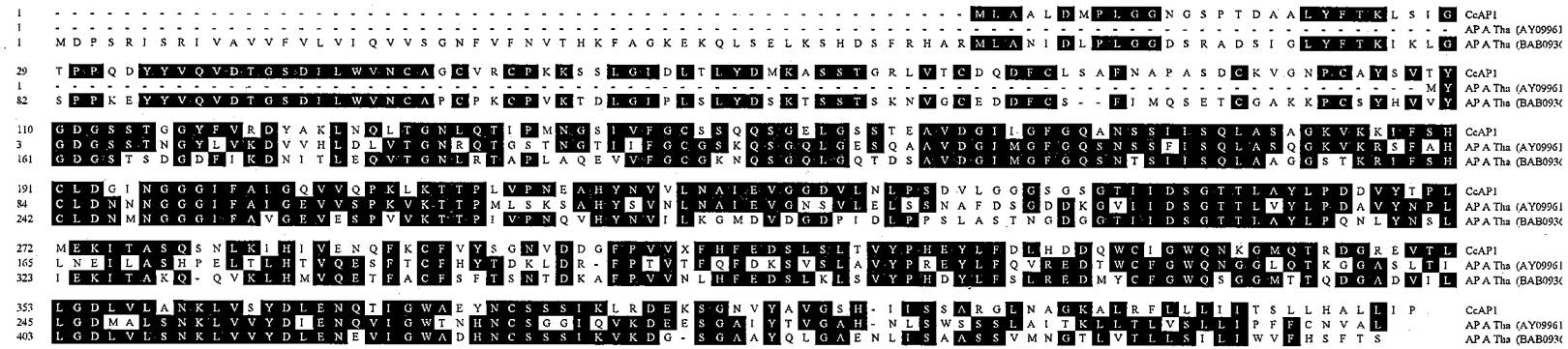


Figure 20. RT-PCR analysis of the expression of CcCP-4 in the whole grain during germination.



CcAPI (SEQ ID NO: 88)
AP A Thn (AY099617) (SEQ ID NO: 89)
AP A thn (BAB09356) (SEQ ID NO: 90)

Figure 21: Optimal alignment of the complete protein encoded by CcAP-1 cDNA with other homologous full-length aspartic proteinase sequences available in the NCBI.

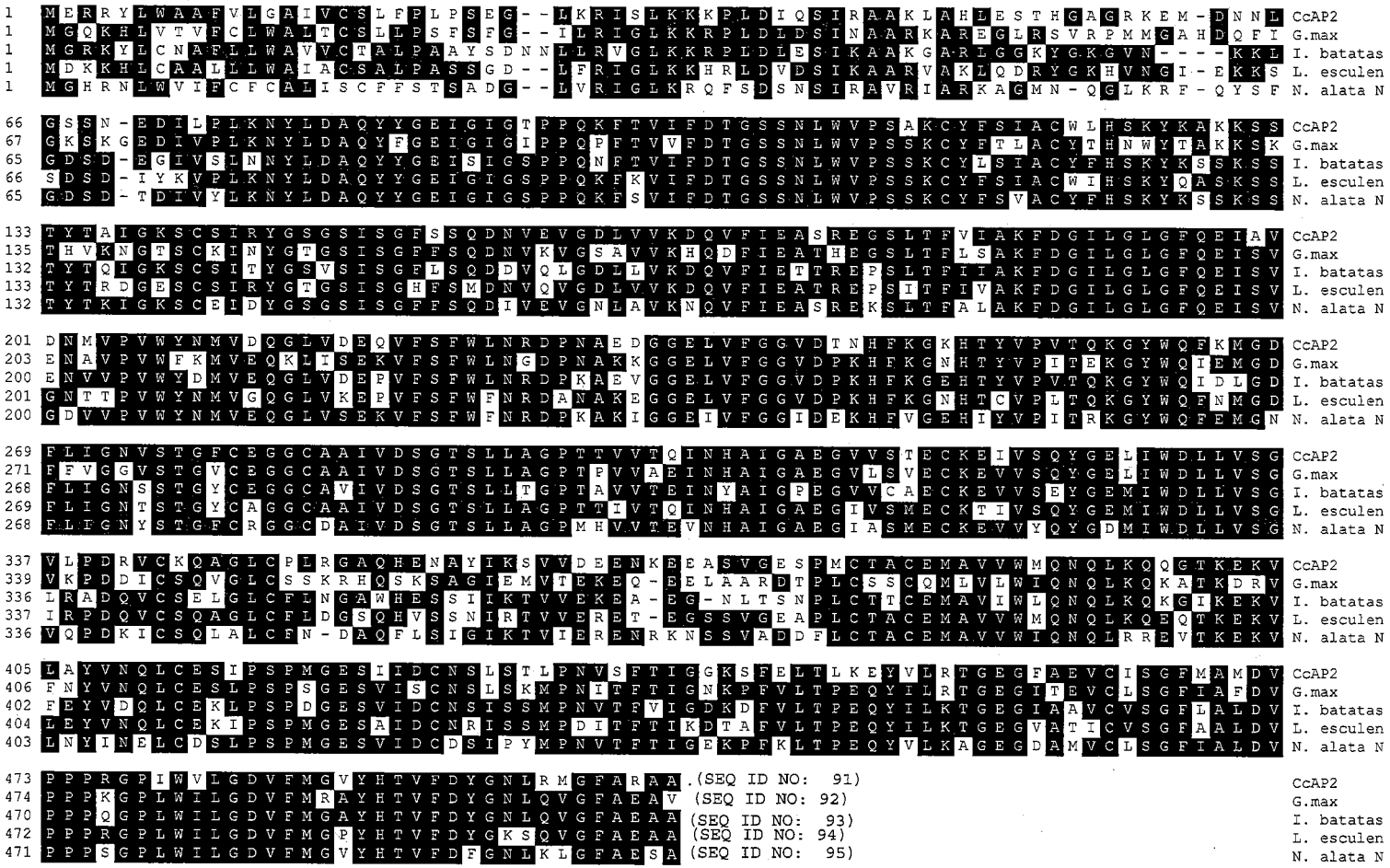


Figure 22: Optimal alignment of the complete protein encoded by CcAP-2 cDNA with other homologous full-length aspartic proteinase sequences available in the NCBI.